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The Challenges of Community-Based Natural Resource Management in Pastoral Rangelands

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ABSTRACT

Recognizing that community-based natural resource management (CBNRM) approaches have had mixed success in pastoral rangelands, this paper compares five case studies—two from Kenya, two from Ethiopia and one from Tunisia—to identify aspects of social-ecological context that affect the implementation and success of CBNRM in pastoral settings. Data for each case was collected following a common protocol. Among the characteristics that emerged from our study as important were socio-political and biophysical characteristics of the wider landscape within which the community's rangeland territory is located and the extent to which that territory is circumscribed by some combination of other land uses and land tenure types, major political boundaries, and physical landscape features. The analysis of these cases suggests that where pastoralist communities coexist in large, open rangeland landscapes, rather than a narrowly community-based approach, natural resource management interventions need to be explicitly multi-level and horizontally flexible.

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Introduction

Community-based natural resource management (CBNRM) is an approach that incorporates “local institutions, customary practices, and knowledge systems in management, regulatory, and enforcement processes” (Armitage 2005, 703). Although CBNRM and theory on natural resource commons had distinct origins, commons scholarship eventually became one of the intellectual foundations of CBNRM (Turner 2004; Saunders 2014). CBNRM approaches in pastoral rangelands, as in other kinds of systems, have

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been guided by some of the principles of mainstream commons scholarship, tending to emphasize clear borders, exclusionary access rules, and the need to overcome free riding (Turner 2011; Undargaa 2017). Strong communal tenure—a system recognized in law of secure and exclusive group rights over land and resources on the land—is typically considered to be crucial for CBNRM (Turner 2004; Murphree 1995), including in pastoral rangelands (Beyene 2015).

Yet, successful implementation both of CBNRM and of legal frameworks for communal land tenure has proven difficult in pastoral rangelands. In designing a CBNRM approach, there are many choices to be made—how to structure participation and representation, what scale of geographic “community” to focus on, whether and how to involve customary institutions, to name a few—and the interface of these elements of the intervention approach with social-ecological context can result in various kinds of challenges. Scale mismatch (Cash et al. 2006) is a common problem where existing state administrative boundaries are used for CBNRM units rather than the boundaries of pastoral resource systems and traditional territories (Robinson et al. 2017). Another challenge arises from the attempt to establish borders at all as it may limit the flexibility and mobility that are crucial for pastoral livelihoods (Fernández-Giménez 2002), exacerbate conflicts (Coppock et al. 2017), and undermine trust (Ulambayar and Fernández-Giménez 2019). CBNRM, hampered by such challenges, has had mixed success in pastoralist settings (Ulambayar and Fernández-Giménez 2019; Reid, Fernández-Giménez, and Galvin 2014).

Some scholarship, emphasizing the need to pay greater attention to the characteristics and complexity of resource systems, suggests that the well-known “design principles” for effective governance of commons (Ostrom 1990) may not be as universal as often believed (Young 2002; Berkes 2006) and that the relative importance of the different principles varies according to the characteristics of the resource being governed (Baggio et al. 2016). For pastoral rangelands specifically, one of the crucial characteristics of the resource system is the great spatio-temporal variability of rainfall, which in turn results in variable and unpredictable availability of natural forage (Ellis and Swift 1988). Nomadism and other patterns of pastoral mobility are an adaptation to this variability (Behnke, Scoones, and Kerven 1993; McCarthy et al. 2004). In pastoralist cultures, institutions and norms have evolved a degree of social-ecological fit with these conditions, often entailing fuzzy and flexible boundaries, and norms and institutions that prioritize the right to access forage over clearly defined ownership rights over land (Cousins 2000; Robinson and Berkes 2010).

These unique characteristics of many pastoral rangelands provide an explanation for many of the difficulties faced by conventional CBNRM approaches implemented in these settings. While traditional pastoral resource governance systems are often referred to as “commons,” upon closer inspection they frequently defy some of the defining features of commons (Behnke 2018; Moritz et al. 2013; Robinson 2019), including the first of the design principles—clearly defined resource and social group boundaries. While it has been argued that the notion of clearly defined boundaries should not be understood as implying that the boundaries of the group or the resource cannot change, overlap, or be subject to negotiation (Cox, Villamayor-Tomas, and Arnold 2016), practitioners of “community-based” approaches have tended to adopt a simplistic and rigid approach to

boundaries and rules of access (Turner 1999). In many pastoralist governance systems, the boundaries of the social group and the resource can be fuzzy and flexible to the extent that they in no way merit the description “clearly defined” (Robinson 2019; Cousins 2000).

Instead, scholarship on pastoralist resource governance has often emphasized the need for a multi-level approach. Multi-level governance implies more than simply having neat, hierarchical tiers of governance; the concept also draws attention to the need for governance actors to be able to adaptively establish different types of vertical and horizontal linkages with other actors and governance mechanisms (Armitage 2007; Berkes 2009). In pastoralist settings, this kind of multi-level governance needs to entail flexibility and allow for overlaps in authority (Fernández-Giménez 2002; Robinson et al. 2017), and emphasize negotiation, reciprocity and the nesting of governance arrangements across levels and scales (Robinson et al. 2017; Flintan 2012).

In attempting to make sense of such observations, recent scholarship on land and resource governance in pastoral systems has described governance models distinct from the well-known categories of private property, state property, commons and open access. One of these is the *open property regime* (Moritz 2016). Whereas in commons scholarship, “open access” is equivalent to a lack of rules and is assumed to invariably result in over-exploitation of the resource, in open property regimes open access to resources is a right that is explicitly enforced, often without a tragedy of over-exploitation resulting (Moritz 2016). Some other pastoral systems are neither classical commons nor open property regimes, instead of being described as *complex mosaic regimes*, characterized by gradations in the strength and clarity of exclusionary property rights over various resources, by an unbundling of property rights for allocation to layered governance mechanisms operating at different levels of social organization, and by the prominence of governance mechanisms other than property rights institutions (Robinson 2019).

The question of what social and ecological conditions in pastoral rangelands are conducive to which kinds of natural resource management approaches and which kinds of property regimes have yet to be thoroughly explored in the literature, but some insights have begun to emerge. Scholarship on pastoralist resource governance has typically emphasized the low productivity and density (Ullambayar and Fernández-Giménez 2019; Turner 2011) and the variability (Behnke, Scoones, and Kerven 1993) of natural resources as being fundamentally important determinants. However, another influential social-ecological characteristic is the extent to which the community of users is spatially circumscribed by some combination of other land uses and land tenure types, major political boundaries, and physical landscape features. In a comparative analysis that coded thirty African pastoralist societies as having some variation of either open property or common property regimes, Moritz et al. (2019) found that pastoral communities situated in more open landscapes were more likely to have open property regimes, and more circumscribed communities were more likely to have some type of common property system (Moritz et al. 2019).

Through a comparative analysis of five case studies, this paper explores the influence of these kinds of contextual factors on the implementation of CBNRM. Two interrelated research questions guided our study. First, what are the aspects of social-ecological

context that significantly affect the implementation and success of CBNRM in pastoral rangelands? And second, what social and biophysical conditions are conducive to what kinds of natural resource management approaches? Whereas scholarship on pastoralists has often emphasized the effects of climatic conditions and state institutions for land tenure, among the characteristics that emerged from our study as also important were socio-political and biophysical characteristics at the landscape scale. From our analysis of these cases we conclude that rather than a narrowly *community-based* approach, most pastoral rangelands require interventions that are explicitly multi-level and horizontally flexible.

Methods

Our study included two cases from Ethiopia, two from Kenya and one from Tunisia in areas where the authors have a history of research on pastoral resource governance and engagement with governmental and non-governmental organizations. The cases were conceived so that each case is an instance of community-based rangeland management, comprised of three main elements: a geographic rangeland unit, a set of structures through which community members participate in governance and management of the rangeland unit, and a development agent supporting the community's rangeland management activities. Therefore, although CBNRM encompasses customary systems and initiatives that are driven by communities, in this research, we examined interventions that were externally facilitated by NGOs and government. All of the cases involved at least an attempt to incorporate into management and governance the features mentioned by Armitage (2005) as central to CBNRM: local institutions, customary practices, and knowledge systems. In this context, a "community," is not necessarily a single settlement. In fact, for all except the Tunisian case, the communities were made up of more than one settlement. The development agent for each case corresponds to one or more governmental or non-governmental organizations that are assisting communities to strengthen, and in some cases establish, governance and management structures for the area they control. Because our research was concerned with governance design, we defined each case by the community governance arrangements as well as by interventions by external organizations and treat the characteristics of community governance as part of the approach being studied. This included describing for each case the approach to deciding on the extent and boundaries of the community territory and nature of membership in the community in order to consider how the case conforms to the first design principle.

The cases were selected to capture some of the diversity in pastoral communities and to involve different sets of external development agents (see Table 1). The two Kenyan cases and the two Ethiopian cases were each chosen from different parts of those two countries. Selection of cases, however, was also partly opportunistic as they were investigated through three different research projects that were all part of a larger, umbrella research program. For all five cases, we endeavored to gather enough intelligence prior to the research to ensure that we were not biasing our selection toward unusually successful or unusually unsuccessful cases.

Table 1. The five case studies.

Characteristic	Shompole-Olkiramatian	Il'Ngwesi	Chenini	Naniga Dera	Dirre
Location	Kajiado County, southern Kenya	Laikipia County, north-central Kenya	Tataouine governorate, southern Tunisia	Bale Zone, Oromia Region, Ethiopia	Borana Zone, Oromia Region, Ethiopia
Ethnicity	Maasai	Maasai	Amazigh	Bale Oromo	Borana (with some ethnic minorities)
Extent of the rangeland unit	Shompole: 62,700 ha. Olkiramatian: 24,000 ha.	9,296 ha.	46,606 ha.	23,722 ha.	728,762 ha.
External agent	South Rift Association of Land Owners and the African Conservation Center	Northern Rangelands Trust, Laikipia Wildlife Forum and Lewa Wildlife Conservancy	Regional agricultural administration of the governorate of Tataouine	Farm Africa and SOS Sahel	CARE and SOS Sahel

Guided by our objective of identifying aspects of social-ecological context that significantly affect the implementation and success of CBNRM in pastoral rangelands, we analyzed the cases using an “options by context” strategy, following a common protocol for describing (i) the option (the particular approach for community-based rangeland management), (ii) the social, economic, political and biophysical context, and (iii) aspects of implementation, outcomes, and impact (Robinson et al. 2018).¹ Many of the variables and characteristics gathered for each case are factual and straightforward, being represented by categorical, ratio, or “yes-no” variables. Because scholarship in this area has begun to identify but has not consolidated what are the most important contextual factors, the approach for each case study was to both gather information on pre-determined characteristics of context but also carry out exploratory, qualitative research. For example, the circumscription of the rangeland landscape had not been included as one of the structured variables in the protocol; however, once this emerged from the qualitative analysis as important, the lead researchers for each case were able to characterize this for their case.

For the Shompole-Olkiramatian, Chenini, Naniga Dera, and Dirre cases, we developed key informant interview and focus group discussion guides based on the protocol (see Table 2). Informed consent from respondents was obtained verbally after an explanation of the purpose and nature of the research, confidentiality of responses, and right to withdraw or to refrain from answering any of the questions. The Il'Ngwesi case study mostly drew on a review of our earlier research, which including data gathering based on an earlier draft of the protocol (Moiko 2015). Since that original research, we often returned to the Il'Ngwesi area through other projects and were able to gather the necessary information to complete the protocol for that case. The methods for each case were variously supplemented with other methods: review of documents, transect walks, etc. The Naniga Dera case also involved a household questionnaire survey in the Bale region, with 40 respondents in Naniga Dera.

Table 2. Methods.

Method	Shompole-Olkiramatian	Il'Ngwesi ^a	Chenini	Naniga Dera	Dirre
Key informant interviews	9	12	10	4	14
Focus group discussions	12	3	2	2	11
Further details on methods	Ontiri and Robinson (2017)	Moiko (2015); Nganga and Robinson (2018)	Sghaier et al. (2020)	Flintan et al. (2019)	Abdu and Robinson (2017); Flintan et al. (2019)

^aThe number of key informant interviews and focus group discussions for Il'Ngwesi refers to the initial study by Moiko (2015). Information in the case study report by Nganga and Robinson (2018) also drew on other primary research (e.g., Ontiri and Robinson 2016; Robinson et al. 2017).

Comparative analysis of the cases made use of the options-by-context case study protocol, with the authors identifying similarities, differences and patterns across the cases. Implementation challenges, outcomes and relative success were assessed for each case primarily qualitatively, based on interviews and focus group discussions with diverse informants, in which we focused particularly on changes in rangeland condition as reported by respondents, in some cases with the assessment also being informed by other studies that investigated ecosystem outcomes. The lead researchers for each case also identified emerging themes from their case.

Findings²

Shompole-Olkiramatian

The two Kenyan cases were each established as a group ranch under the Land (Group Representatives) Act of 1968. The Act aimed at commercializing pastoral livestock production and incentivizing pastoral communities to manage their land as ranches by enabling them to hold collective title to a parcel of land (Mwangi 2006), but was only ever implemented in Maasai and, to a lesser extent, Samburu areas. The Shompole and Olkiramatian case is comprised of two adjacent group ranches, each of which was formally established by local Maasai community members as a group ranch in 1979. These two communities do much of their planning together and have both been supported by the same non-governmental organizations (NGOs) and we, therefore, considered them together as a single case. Respondents indicated that after the creation of the group ranches, over time, lack of transparency, disagreements over subdivision and privatization, and failure of the group ranches to deliver anticipated benefits led to concerns among community members. Therefore, when the African Conservation Center began working with these communities in the mid-2000s, the strengthening of leadership and governance was made a key focus of their work. Some of our respondents emphasized that a pivotal step that followed was the creation of the South Rift Association of Land Owners, an organization that represents and belongs to fifteen group ranches in Kenya's southern rangelands, including Shompole and Olkiramatian. It has been able to provide ongoing, hands-on support to the communities beyond what the African Conservation Center could have done on its own, helping the communities to strengthen and formalize planned grazing based on traditional Maasai

approaches. This included establishing various grazing zones and grazing schedules that aimed at lengthening resting periods.

The social-ecological context for the Shompole-Olkiramatian case is characterized by the relative ethnic homogeneity of the larger landscape within which it is set, which helps to limit conflict, and the relatively secure land tenure. The legal framework for group ranches in Kenya provides clear collective tenure rights, although enforcement of those rights by the state is sometimes lacking. Shompole and Olkiramatian is also the most circumscribed of our five cases: considering the two group ranches together as a unit, an escarpment and the Magadi salt flats partly insulate them from the wider landscape. Another part of their external boundary is the international border with Tanzania, and although for pastoralists international borders are not always an effective barrier, they are more permeable than sub-national administrative boundaries.

Community-based rangeland management for these two communities has produced positive results, having reduced the amount of degraded bare ground largely by ensuring the periodic resting of pastures and thereby increasing the availability of forage for herds during dry periods. Respondents indicated that livestock body condition and access to milk have improved. Other benefits include employment for some community members as scouts or in the lodges. The return of big cat species to the area suggests that there have also been improvements in ecological terms. Although some communities are unhappy members about the prominence that conservation objectives have in the planning, we found that generally the sense of ownership that community members have for the rangeland management processes has been strong. The successful management of grass bank reserves itself creates a challenge, attracting herders from other locations into the area which results in disputes; the geography of the two group ranches, however, limits this problem.

Il'Ngwesi

For the other Kenyan case, Il'Ngwesi, the community has been supported by a wider array of organizations than is seen for our other cases. The relationship with two of those organizations—Lewa Wildlife Conservancy and the Laikipia Wildlife Forum—has been long-term, dating back to the mid-1990s when the group ranch was established. At that time, Lewa Wildlife Conservancy engaged with elders, assisted in establishing an ecotourism lodge and helped the community with formal establishment of the group ranch. Laikipia Wildlife Forum later supported the community to reassess and revise its governance. Whereas decision-making had been centralized in the group ranch committee, in 2005 the group ranch's constitution was amended to delegate some natural resource management and income generation functions to two new structures: the Il'Ngwesi Community Trust and the Il'Ngwesi Company Ltd. Also included in the new governance structure were grazing committees at a lower, “neighbourhood” level for more localized decision-making on some aspects of grazing planning. Il'Ngwesi is also a member of and is supported by the Northern Rangelands Trust, a prominent non-governmental organization in northern Kenya.

Laikipia Wildlife Forum also supported the community to adopt elements of the holistic management approach (Savory 1988). As such, Il'Ngwesi's rangeland management and interventions for producing livestock feed are the most elaborate of the five cases.

Although external organizations have provided important support to the community, respondents highlighted that overall grazing management has been very community-driven.

A key feature of the context is that the larger landscape is a vast rangeland that is home to multiple pastoralist ethnic groups. It is also characterized by a significant gradient in rainfall: at Il'Ngwesi itself, in the south of this landscape, rainfall is higher (810 mm p.a. at Il'Ngwesi), but only 150 km further north it drops below 500 mm. This rainfall gradient and other physical features create a heterogeneous landscape in which the nature of pastoralism varies greatly. Generally, in the drier areas mobility with herds covers longer distances and varies more from year to year, with some other pastoralist groups in the area having a history of long-distance migration to access resources throughout the area when conditions require. A transition in land tenure roughly coincides with the rainfall gradient. Land in Laikipia County generally is demarcated and belongs to known owners—private owners, the state, and group ranches such as Il'Ngwesi Group Ranch. Further north beyond Laikipia, however, most land has been categorized as Trust Land (Ontiri and Robinson 2016). Officially, this land has been held in trust by the state; in practical terms, however, it has been under partial control of customary governance systems that have eroded to varying degrees. Arguably much of this Trust Land has effectively been an open-access resource. This has affected the implementation of property rights in Il'Ngwesi and other group ranches in Laikipia, with herders from Trust Land areas bringing their livestock into the area in defiance of the group ranches' grazing rules. Whereas formal communal ownership of the land is clear, community members feel that enforcement by the state of the community's right to determine who can access their land has been haphazard.

Our interaction with respondents suggests that, on the whole, community members have a strong sense of ownership of the community institutions and rangeland management activities. Like Shompole and Olkiramatian, the rangeland management activities of Il'Ngwesi were very successful for several years. Evidence of this can be seen in the way that improved rangeland condition has attracted herders from other places in northern Kenya. During the droughts of 2015 and 2017 particularly, large livestock herds were trekked into various places in Laikipia County, including Il'Ngwesi. Reserved grass banks were decimated and there was violent conflict and loss of lives. This resulted in much of the benefits of the community's rangeland management efforts going to others, and this has somewhat diminished the enthusiasm of community members for the rangeland management efforts. Nevertheless, there are signs that the Il'Ngwesi community continues to learn and adapt. For more than ten years having had an organizational structure in which authority was divided among the group ranch committee, the community trust and the company, the community came to the collective decision to simplify the structure and once again consolidate decision-making under the group ranch committee. The issue of incursion of herders from elsewhere, however, has not been resolved.

Chenini

Governance arrangements for the Tunisian case—Chenini—trace their origin to a traditional institution called “Myâad” which was composed of the local tribes' leaders and

which managed the dates for opening and closing different rangeland areas. In 1935, the Myâad was transformed by the government into a more formal structure called *Conseil de Gestion des Terres Collectives* (Collective Land Management Council), managing an administrative unit known as *imada*. In the 1990s, the Tunisian government further created formal community-based organizations called *Groupeement de Développement Agricole* (“Agricultural Development Group,” essentially a farmers’ association—French acronym, GDA), as more inclusive local users’ associations that directly manage users’ access to rangelands and facilitate collective actions for rangeland management. The Conseil de Gestion is more concerned with access to and local administration of land and the GDA more with day-to-day investments and management activities for the rangelands and resource use. These two local institutions also connect with public agencies to get technical and administrative support when implementing a traditional form of pasture resting. Since 2004, the Chenini GDA has been receiving support from the Agropastoral Development and Local Initiatives Promotion Programme for the South-East project (French acronym PRODESUD), funded by the International Fund for Agricultural Development. PRODESUD supports the GDA to develop collective infrastructure and partly subsidizes community members while they are resting some parts of their rangelands. Chenini and other communities in the area have also been supported through different rural investment programs and technical expertise for rangeland restoration and grazing planning.

The broader social-ecological context for Chenini is characterized by an intermediate level of both social heterogeneity and circumscription: the wider landscape has two ethnic groups, and Chenini is partly circumscribed by mountains on one side but is quite open on the other side. The territory contains rangelands under both private and collective tenure, and generally borders and ownership for the rangelands are known and legally recognized, but with some contention over ownership and use, especially in the communal lands. The community institutions often have difficulty exercising collective property rights.

After about fifteen years from the beginning of the implementation of this approach in Chenini, many positive ecological and socioeconomic outcomes have been observed. In focus group discussions, community members and other stakeholders agreed that rangeland condition has improved and that the approach has reduced risks of desertification and degradation. Also, the approach seems to have had positive effects on biodiversity. Socio-economic outcomes identified by respondents include an increase in the participation of youth and other stakeholders in rangeland management, and a reduction on costs for activities such as supplemental feeding, transportation of livestock, and watering.

With these successes, community members began to accept the process led by the *Conseil de Gestion* and the GDA and the feeling of ownership improved. There are also clearly improved interactions between the community and government agencies. As with the two Kenyan cases, the success of the approach attracted the intrusion of some neighboring pastoralists. However, the Tunisian Union of Agriculture and Fishing, of which GDA members are a part, plays an important role in intercommunity dialogue and dispute resolution. By virtue of being a representative civil society organization while also having strong connections with and support from government, the union has high level of legitimacy, and intercommunity disagreements over grazing are almost always resolved without major conflicts.

Naniga Dera

Activities related to the Naniga Dera case in Ethiopia were carried out under the umbrella of the Supporting the Horn of Africa Resilience project being implemented by Farm Africa and SOS Sahel, funded by the European Union through the International Water Management Institute. Farm Africa and SOS Sahel have a history of working in this area, including in forest management activities. As such, their approach has borrowed from the participatory forest management approach which had been mainstreamed in Ethiopian government programs, including settling on cooperatives as the primary organizational form for community management of rangelands. Their approach was also guided by Participatory Rangeland Management (Flintan and Cullis 2010), but only as applied at the local level and without significant landscape level interventions. The cooperatives were established at kebele level (the lowest administrative level in Ethiopia) and further subdivided into grazing blocks with a grazing committee for each block. A rangeland management plan was developed, the main interventions having included seasonal grazing planning, bush clearing and pasture reseeding.

Naniga Dera is set within an area that is ethnically relatively homogeneous. It is part of the Bale Mountains ecoregion, in which some families have people living at locations at different altitudes with herds of livestock being moved seasonally between highland and lowland areas, and herders from different kebeles traditionally moving their herds to each other's areas at certain times of the year. In Ethiopia, although pastoralists have a constitutionally recognized usufruct right to communal land for their livelihoods, all land is held by the state in custodianship for the Ethiopian people. As such, communities have had little recourse when the state decided to allocate any piece of land for investment projects or other uses. The lack of tenure security has constrained the ability of the community to enforce rules related to land and natural resource use.

Awareness and sense of ownership of the rangeland management efforts among community members is strong. Community members affirmed that there had been improvements in rangeland condition, a perception that was borne out by analysis of rangeland monitoring data, which have shown an increase in the ground cover of grasses and forbs (Flintan et al. 2019). However, because the approach taken by the project was geographically-limited by administrative boundaries (kebeles), rather than a broader landscape approach that included the full territory used by herders, the establishment of kebele level rules and regulations upset traditional reciprocal arrangements between Naniga Dera and neighboring communities. This made the enforcement of rules and regulations difficult, and the Naniga Dera Rangeland Management Cooperative was not able to limit or otherwise exercise authority over incoming herders from other locations. Relations between Naniga Dera and neighboring communities started breaking down.

Dirre

For Dirre, the other Ethiopian case, CARE and SOS Sahel, through their Pastoralist Areas Resilience Improvement through Market Expansion project funded by the United States Agency for International Development have pursued a strategy of working closely with customary Borana institutions and territories. A multi-level approach based on customary Borana social organization is being used, with a representative council for

each of the five customary Borana *dheeda* grazing territories, and meetings and councils at the lower *reera* and *arda* levels. The project struggled in the early stages because the intention to support rangeland management organized spatially according to customary territories received little backing in government circles, where an approach following government administrative boundaries was preferred (Abdu and Robinson 2017). CARE and SOS Sahel then began to adapt their approach. They have continued to work according to the customary territories of dheedas, reeras and ardas, but over time put greater emphasis on coordinating with the government. Technical practices have included the development of seasonal grazing plans at larger scales, and site-specific interventions such as rehabilitation of community exclosures managed at lower levels.

The wider landscape context where Dirre is situated, while biophysically heterogeneous, ethnically is quite homogeneous, being dominated by the Borana throughout. As with Naniga Dera, the lack of tenure security has undermined the ability of the Dirre dheeda council to implement and enforce grazing plans and rules. While Borana customary institutions on which the approach is based are still influential, collective land and resource management rights are susceptible to being overruled, ignored and contested because of lack of state recognition.³

The interventions at Dirre case are more recent than those of the other four cases, and the improvements in rangeland condition are not as pronounced. Activities in the Pastoralist Areas Resilience Improvement through Market Expansion project, got underway somewhat later in Dirre dheeda than in the neighboring dheeda of Gomole and benefited from lessons that project personnel had learned along the way. In later stages of the project, they gave greater attention to management at multiple levels rather than only at dheeda level and to coordination with government decision-makers. However, there was not widespread participation of community members in dheeda-level planning processes, which relied on representatives from each of the reera subunits in the dheeda, and the local level interventions have not been well-connected to dheeda level decision-making. Moreover, unclear allocation of governance powers between various centers of authority has hampered decision-making. Although the project has had positive results from site-based interventions, especially the rehabilitation of community exclosures, by the time of our research, the development and enforcement of dheeda level grazing plans had not progressed very far.

Discussion

Cross-Case Comparison

Perhaps the most obvious difference among the case studies relates to the geographic extent of the rangeland unit—the community territory that corresponds to the main level at which decisions on rangeland management are made. Whereas the smallest rangeland unit is Il'Ngwesi at 9,296 ha., the largest, Dirre, is more than 75 times as large at 729,000 ha. (see Table 1). Nevertheless, all five of the cases were based on a territorial approach that involved one or more external agents providing support to a pastoralist community by helping to build local institutional capacity for management of natural resources over a specified territory. In the Naniga Dera case, a community organization—the Rangeland Management Cooperative—was created; in the other cases, local

governance arrangements already existed when the CBNRM interventions began. In all five cases, however, the external agent(s) implemented activities to build governance capacity, in some cases helping the community to revise the organizational structure, and supported technical rangeland management interventions that were undertaken either by, or in consultation with, the community governance organizations. (See [supplemental material](#) for a comprehensive summary of the approaches used in the cases.)

Whereas the approaches used were broadly similar, differences in the challenges faced, outcomes, and the broader social-ecological context were more obvious (see [Table 3](#) for a summary of the outcomes for each case). While the ability of community-based rangeland management to produce positive environmental outcomes was evident in these cases, so too was the challenge of maintaining rangeland management plans and rules when outsiders would bring their herds into the area. In fact, success in rangeland management itself attracted this problem. Not surprisingly, the nature of land tenure was a key factor affecting the implementation of community-based rangeland management activities and the results. In both Ethiopian cases, the incomplete tenure security has constrained the ability of the community institutions to enforce rules related to land and natural resource use. For the Tunisian case and the two Kenyan cases, the tenure status of communal rangelands is quite clear. Nevertheless, all three face some challenges. Shompole and Olkiramatian have been subject to attempts at land grabbing and fragmentation through individualization. For Chenini, the capacity of the *Conseil de Gestion* and the GDA to enforce community's external borders and collective management rights is sometimes weak. The challenge of excluding herders from other places or getting them to follow local grazing rules was most critical for Il'Ngwesi, where the difficulty of exclusion and of implementation and enforcement of collective property rights escalated to the point of violent conflict, despite the formal security of tenure that the group ranch status provides.

Circumscription

One critique of the Ostrom design principles has been that the properties of the resource system are not sufficiently accounted for (Young 2002). Literature on pastoral land and resource governance on the other hand has been very concerned with at least some aspects of social-ecological context, repeatedly emphasizing that herd mobility and norms and institutions that prioritize access and flexibility are adaptations to the low density of resources (Ullambayar and Fernández-Giménez 2019) and their variability across time and space (Behnke, Scoones, and Kerven 1993; McCarthy et al. 2004). However, the scholarship on pastoralism has given less attention to more local social and physical landscape characteristics. Although the relative circumscription of the landscape was not included among the contextual characteristics in our case study protocol, it emerged as particularly important shaping what kinds of governance and management arrangements are possible.

Shompole-Olkiramatian is the most circumscribed of our five cases, and is also the case for which conventional principles of CBNRM have been implemented with the fewest difficulties. Although they have been quite successful in their rangeland management and have not experienced difficulties related to mobility, conflict and resource

Table 3. Summary of outcomes of the CBNRM activities and community management.

Types of outcomes	Shompole- Olkiramatian	Il'Ngwesi	Chenini	Naniga Dera	Dirre
Ecological outcomes	Bare ground reduced. Forage availability in dry season improved. Large predators and herbivores have returned.	Increased grass cover overall and development of drought grass banks. Increase in megafauna.	Improvement in rangeland condition, return of native species, and increases in plant and animal biodiversity.	Improvement in ground cover and the availability of forage. Decline in woody species.	Positive for site-based interventions. Too early to assess dheeda-wide outcomes.
Socio-economic outcomes	Income and employment from tourism for some people. Organized collective livestock marketing.	Social investments into education. Improved drought coping. Diversified livelihoods.	Increased productivity/reduced costs for livestock production, increased income from livestock.	Stronger participation of community members in decision making processes over their land. Women's empowerment as part of this.	Too early to assess socio-economic outcomes.
Acceptance, legitimacy and ownership	Some internal contestation, but sense of ownership among community members is strong.	Some internal contestation, but sense of owner-ship among community members is strong. Some degree of fatigue with the most intensive management methods when benefits are captured by in-migrating herds.	Acceptance of CG and GDA rangeland management activities has grown. Increasing involvement of youth in rangeland planning.	High level of awareness of the RMCoop and participation in rangeland planning and implementation activities among community members.	Unclear how aware the general populace is of the dheeda level rangeland management council.
Conflict and contestation	Disputes over grazing rights, but these are relatively minor. Need for greater coordination among group ranches in the area.	Occasional large scale incursion by herders from elsewhere. Serious conflicts with loss of life. Collective property rights not enforced.	Occasional and limited incursion by herders from neighboring regions, which are usually resolved quickly.	Incursion of herds from elsewhere and inability of RMCoop to enforce grazing rules for these visiting herds.	Unclear allocation of governance powers between rangeland management council and government actors. Challenges mobilizing support at local (sub-dheeda) level.

sharing to the same extent as some of the other cases, their success derives not only from the details of the approach that was implemented but also from their particular context. In contrast, the other cases all exist within larger and less circumscribed landscapes. In a biophysical sense, at least some of the external borders of the community territories are somewhat arbitrary. This echoes recent literature suggesting that circumscription of the pastoral territory is a key factor contributing to the emergence of common property systems rather than open property regimes (Moritz et al. 2019). A conventional CBNRM strategy in which the central premise is to have clearly defined communities each managing their own clearly defined territory will tend to be more effective in settings similar to that of Shompole and Olkiramatian in which the political and physical landscape reinforces communities' external boundaries than it will be in larger, more open rangeland landscapes.

The Need for Governance and Management at Multiple Levels

This conclusion does not necessarily mean that there is no role to be played by territorial units such as group ranches or traditional territories such as dheedas or imada, together with their corresponding community institutions. What these cases do suggest, however, is that interventions are needed at multiple levels. For Il'Ngwesi, the central driver of the challenges they have faced since 2015 has been the incongruity between management implemented at the group ranch level and the way pastoralists in the wider landscape use the rangelands (Nganga et al. 2019). Similarly, the effective excision of Naniga Dera as a unit separate from the wider landscape led to conflict between Naniga Dera and its neighbors.

In the Dirre case, on the other hand, the primary territorial unit for community decision-making—the dheeda—is vast, too vast in many ways to get the full “buy-in” and support of all its residents who are significantly distanced from decision-making processes. The localized interventions supported by NGOs have not been well connected to decision-making at the higher, dheeda level and do not address the overall spatial pattern of how Borana livestock owners use resources. At the same time, there has been a disconnect between dheeda level governance and the day-to-day experience of herders, making the dheeda level grazing plans difficult to implement.

Chenini provides an interesting contrast to the other cases. Its territory is only partly circumscribed by the physical landscape, and where it shares open, incompletely defined rangeland borders with neighboring communities there are occasional incursions and disputes. However, the strong presence of government institutions and a supportive legal framework together with the presence of mechanisms to facilitate intercommunity dialogue have contributed to the quick resolution of such disputes and to the consolidation and stability of the approach. The approach used in the Tunisian case can be understood as something that involves processes happening at two levels—the level of an individual Conseil de Gestion and its *imada* territory, and at an intercommunity or landscape level where the Tunisian Union of Agriculture and Fishing facilitates dialogue and conflict resolution.

Many of the stakeholders working in these areas have begun to recognize the need to overcome scale mismatch (Cash et al. 2006) between government jurisdictional scales

on the one hand and actual patterns of resource use and customary systems on the other, and the importance of having interventions at multiple levels. Our findings echo scholarship that argues the Ostrom design principles may not be completely valid when applied to complex, large scale common pool resource systems (e.g., Young 2002). Insofar as the term “community-based” implies working only or even *primarily* at some kind of a community level, whether that community and its territory are small or large, the idea points in the wrong direction. Instead, what is needed in pastoral rangelands where climatic variability is high, where herders feel a recurring need to access distant resources, and the rangeland landscapes are large and very open is an approach “that is participatory but not necessarily ‘community-based’, at least not as that term is normally understood” (Nganga et al. 2019, 16). Resource management approaches for pastoral rangelands must also be explicitly multi-level. Commons scholarship has recognized the multi-level nature of natural resource commons (Berkes 2009), influencing approaches and concepts such as *adaptive co-management* and *adaptive governance*. However, this recognition has had limited influence on externally facilitated CBNRM interventions, where the first design principle for effective governance of commons (Ostrom 1990)—clearly defined resource and group boundaries—has been embraced, while another—the nesting of enforcement, conflict resolution and other governance processes across levels—has received little attention.

An explicitly multi-level approach to participatory rangeland management would entail, at its simplest, planning and action both at a local level where community members have a direct connection to management actions, and at a landscape level corresponding to patterns of mobility and differential use of resources in rainy seasons, dry seasons and drought. Support to governance and management processes at the lower level is needed to afford all users the opportunity to participate in decision-making and to more easily see the results of management actions: this was somewhat weak in the Dirre case. This very local level decision-making must be nested within processes of negotiation, shared rules, or joint planning at the scale of the larger landscape: weakness here has been the crux of the challenges faced in Il’Ngwesi and Naniga Dera. Moreover, as discussed in some of the literature on multi-level resource governance (e.g., Armitage 2007; Robinson et al. 2017), for many pastoral rangelands, thinking in terms of only two levels will be too simplistic; instead, interventions for negotiation, planning, and strengthened governance are needed at multiple levels and across scales with horizontal and vertical connections for sharing information and channeling authority and resources.

Conclusion

This study compared five community-based rangeland management cases from three different countries. The approaches used in the cases differed in the type of community organizational model employed and the geographic extent of the rangeland unit managed by the community organization. There were signs of positive environmental outcomes in all of the cases, even if at an early stage in the two Ethiopian cases. At the same time, there were also two key challenges that cut across the cases, with one or both of the challenges being faced in some measure by every one of the local

community rangeland management organizations. The first challenge arose from the organization's relationship horizontally to communities and herders from elsewhere in the larger landscape, and the second from its relationship vertically to government. In considering our first research question, the findings suggest a few elements of social-ecological context that affect the implementation of CBRNM in pastoral rangelands and the ability of communities to manage these challenges. These include formal recognition of communal land tenure and the presence of institutions that can mediate between communities at a landscape scale. The implementation and success of CBNRM interventions were also particularly affected by the extent to which the community's territory was circumscribed by some combination of physical landscape features, other land uses, and major political borders in a way that restricts migration of herds, confirming conclusions reached by Moritz et al. (2019).

Regarding our second research question—identifying social and biophysical conditions conducive to different natural resource management approaches in pastoral rangelands—this study has only scratched the surface. We do conclude that landscapes that are circumscribed by social and physical barriers are more conducive to the development of classical commons institutions—whether emerging through bottom-up action by local communities or through interventions by external development agents—than landscapes where such barriers are lacking. In large and very open pastoral rangeland landscapes, initiatives to support participatory rangeland management by pastoralist communities must explicitly involve negotiation, planning and management at multiple levels.

While our case studies focused on resource management initiatives rather than on land tenure, our findings nevertheless have implications for land tenure interventions in pastoral rangelands and how these might interface with rangeland management. In many pastoral settings, because of climatic variability, patterns of herd mobility, and pastoral norms that prioritize rights of access, rangeland resource governance may benefit from having some degree of overlap in governance powers and property rights between governance mechanisms operating at different levels (Flintan 2012) as implied by the complex mosaic regime model of pastoral land governance (Robinson 2019). Strengthening communal tenure security in pastoral rangelands is vital, but will require an approach that reflects the flexibility, mobility, and multi-level nature of pastoral systems.

Notes

1. For a complete listing of these characteristics and variables, see the [supplemental materials](#) for the paper.
2. A table based on the case study protocol and presenting summary findings for all of the cases can be found the [supplemental material](#) for the paper.
3. The situation has recently begun to change. Dirre received its communal land certificate in 2018, when our field research was nearly complete.

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